

Statement of
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Mr. Chairman, Congressman Schock and members of the committee, thank you for the invitation to testify before you today on the importance of small businesses working with Federal research facilities to promote innovation and entrepreneurship. I believe that I may have a unique perspective to offer this committee in that I have been both a Director of a National Laboratory and am now involved in several small technology companies that are working with Federal research facilities.

I spent 20 years with the USDA Agricultural Research Service and 12 of those as Director of the National Center for Agricultural Utilization Research in Peoria, Illinois. As a scientist and administrator I was an early user of the 1986 National Technology Transfer Act - Cooperative Research and Development Agreement, or CRADA authority, to work with many companies to commercialize new discoveries. In addition, I testified before the House Agricultural Committee on ways to expand the technology transfer capability of ARS that resulted in legislation to expand the ability of small companies to commercialize USDA inventions. This language gave ARS research laboratories the authority to partner with private companies and use government pilot plant facilities to develop products and processes for commercial demonstration. In sum, I have seen first

hand the benefit, and even the necessity, of Federal laboratories working with the private sector in creating economic value from basic science discoveries.

While legal tools such as the Stevenson-Wydler Technology Innovation Act, the Bayh-Dole Act, the National Technology Transfer Act and other authorities have proven beneficial to both Federal laboratories and small business, there are some significant issues that could be addressed to enhance the capabilities of small businesses to advance the national research agenda leading to economic development.

Since leaving the government, I have been involved with several companies that needed to approach technology commercialization in very different ways. In one, we took fundamental knowledge discovered by the USDA laboratory and refined the concept to develop commercial production methods to manufacture an advanced bio-based product. Absorbent Technologies, Inc. makes ZEBA, a starch based 'hydrogel' that holds and releases water similar to a sponge below the soil, for use by plants and food crops on an as-needed basis. Each small granule holds 500 times its weight in water, nearly all of which is made available to the plant in response to plant root suction. By creating an "on-demand" moisture and nutrient reservoir, ZEBA not only reduces the level of water and nutrient inputs required, but also reduces plant stress resulting in greater yields and heartier, higher quality crops. This company made use of the USDA CRADA process early on and quickly achieved results that gave it the ability to obtain venture capital funding to bring its products to the marketplace. Today we are selling this innovative product for commercial agriculture and lawn and garden applications in more than 10

countries worldwide. The government created the basic idea and the private sector party provided expertise to develop a product and implemented commercialization efforts. This is a simple model for technology commercialization resulting in jobs and the creation of economic benefit from scientific discovery. But such successful innovations are not usually this straight forward. Often there are many complications on the way from the laboratory to the market place.

I also serve as Chief Technology Officer of Biofuels Manufactures of Illinois, LLC. BMI was formed to build and operate a biodiesel production facility in central Illinois. What distinguishes our effort is that we have been working with the USDA ARS to develop a new energy crop called Pennycress.

Pennycress is a member of the mustard family that has seeds with 36% oil, twice that of soybeans, and can be used to make a high quality biodiesel fuel. The crop is planted in the fall after corn harvest, grows as a winter annual and is harvested in late spring before soybean planting. Farming Pennycress uses traditional equipment and allows farmers to grow two crops in the year earning additional income. As a non-food crop that does not displace food crops from land or the marketplace, it avoids both the food vs. fuel and Indirect Land Use controversies completely.

The economic impact of this new energy crop is significant. A single 45 million gallon per year biodiesel plant will purchase \$100 million of Pennycress seed each year. This is new money flowing into the local agricultural economy and has significant multiplier

effects on consumer purchasing and employment. Illinois alone has the land capacity for 18 such operations so the economic impact of Pennycress as an energy crop across the mid-west corn belt is extraordinary.

It was USDA research scientists who discovered the potential of Pennycress but they are, by the nature of their mission and legal authorities, unable to actually bring about commercialization of this remarkable new energy crop. Therefore, the only way for the nation to benefit from this discovery is for the government to collaborate with the private sector. However there are a number of issues that have made it very difficult for a small business like ours to work effectively with federal agencies to commercialize this new energy crop.

BMI and its partner R&D company, Arvens Technology, Inc. have made significant financial investments in both its own research activities and sponsoring work at two Federal laboratories and a state university through CRADA agreements. Our project requires research to optimize Pennycress farming and processing technology at least through the demonstration stage before private investors can be attracted to fund commercial operations. Our company has formed business relationships with farmers to begin large-scale production of Pennycress. In addition, we have developed processing methods for this unique crop. Clearly it takes significant up-front financial capital to create such a new energy crop, develop its logistics infrastructure and optimize processing technology. All of these investments must be made before revenue is generated.

Because this project meets both USDA and DOE strategic objectives in creating sustainable energy sources, we have applied for funding with our USDA research partners to advance this work. One of the requirements of these grant applications is that a 20% financial match be provided by the applicant. For small start-up businesses like ours, this is a major problem. We are currently providing funding to two Federal labs and a university but that does not count to meet the match requirement. It is ironic that BMI and its partner companies are funding USDA and university research rather than being able to obtain contracts from them to perform the important task of creating a new environmentally friendly, sustainable energy source that is in the nation's interest.

My first recommendation to the committee is to examine the policies that require small businesses to provide these significant financial matches in the grant application process. Large companies do not have a problem in making the financial match by providing "overhead" services that are part of a larger commercial enterprise. A small technology company cannot do this. This match requirement significantly limits small companies in the scope and duration of their project proposals. We can only propose projects up to the limit of our available financial resources to cover the required match. We believe that some of the most creative and capable technology companies are not competing equally for these research contracts because of this requirement. The elimination of this match requirement or at least making it proportional to the size and resources of the small technology business would ensure that such companies have full access to these contract opportunities.

A second problem that my company has run into, involves the requirements of the loan guarantee programs of USDA. We have been seeking commercial loans for the construction of our biodiesel plant. With the current lending climate and tight credit, private financing is difficult without some form of risk mitigation for the banks. We considered seeking assistance from the USDA Rural Development Agency under its Section 9003 BioRefinery Assistance Program but found that the process has several requirements that limit small companies like ours from applying for loan guarantees.

The loan program requires that both the borrowing company and a lending bank partner in the application process. The Agency will approve loan guarantees only for lenders of considerable size and experience in similar projects. This is particularly limiting for companies located in rural communities away from large money center, commercial banks. We have been able to put together a consortium of local community banks willing to work with us but none of them have the experience to be the lead institution necessary to satisfy the requirements of the RDA program.

My second recommendation is to examine Federal loan guarantee program policies and determine if they maximize the opportunities of both small businesses and local banks to create jobs and economic development based technology innovation and entrepreneurship. There should be an appropriate match between the requirements of the Agency and the size of the loan guarantee requested. Without some sort of “starter” program, local technology and financial organizations will not be able to develop the

capacity to participate in larger projects.

In my many years as a scientist in a university, government laboratory and private company I have seen the evolution of thinking and subsequent enactment of laws that enhance the ability of the nation to benefit from the public investment in science and technology. This has been an incremental process with improvements made as challenges and roadblocks are discovered and surmounted. I hope that today I have provided some information that this committee can consider in its work to maximize the opportunities of small businesses to work with Federal research laboratories that promotes entrepreneurship and innovation. Thank you for this opportunity to talk with you. I would be happy to answer any questions at the appropriate time.